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4.4 Test of Pressure Transient Analysis

This test verifies that FEHM has correctly implemented the pressure equations, i.e., the conservation of mass with Darcy's law, and that radial geometry has been correctly implemented. Figures 31 and 32 show that the FEHM results are in good agreement with the analytical solution. The results, compared numerically to the analytical solution (found in files *theisout.analyt_pos* and *theisout.analyt_time*) are given in Table 46. The maximum absolute error for this simulation was less than 0.0003 MPa, and the percent errors were less than 0.03%. These results meet the acceptance criteria for this test suite developed in Chapter III.

Table 46. Results of the test of the pressure transient analysis

V&V test	Maximum error	Maximum % error	RMS error
Pressure versus time			
at r = 0.00144 m	0.1594e-04	0.1593e-02	0.6169e-06
at r = 3.44825 m	0.1548e-04	0.1548e-02	0.5902e-06
Pressure versus position			
at t = 1 day	0.1564e-04	0.1564e-02	0.1439e-05

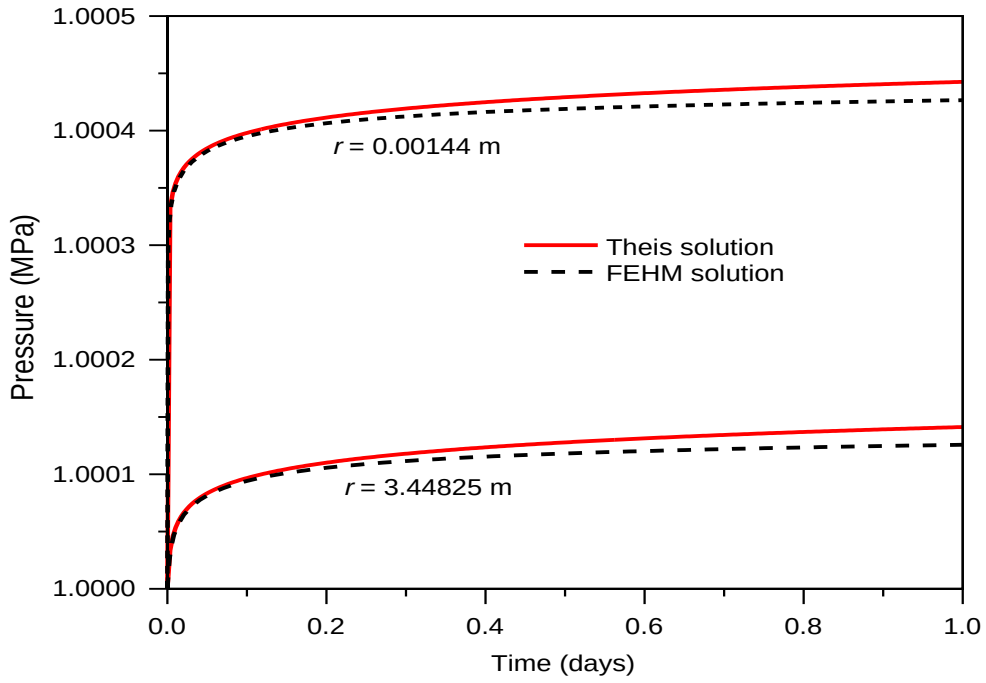

Figure 31. Comparison of FEHM and Theis solutions for pressure versus time at r = 0.00144 m and r = 3.44825 m from the wellbore.

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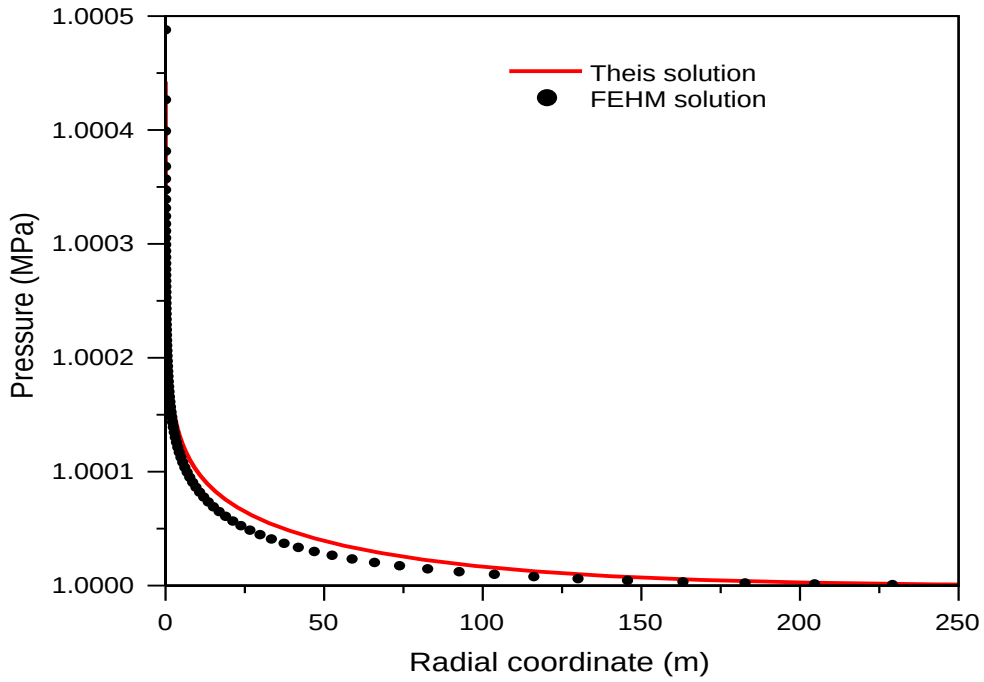

Figure 32. Comparison of FEHM and Theis solutions for pressure versus position at *t* = 1 day.